

**REMARKS****Double Patenting Rejection.**

5 The Office Action stated that "Claims 1-69 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,712,040."

10 The Office Action also stated that "a timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application.

15 Applicant therefore submits herein a properly filed terminal disclaimer in compliance with 37 CFR 1.321(c).

**35 U.S.C. § 102. Claim Rejections.**

20 Claims 1-69 are rejected under 35 U.S.C. §102(b) as being anticipated by Renault et al. (U.S. Patent No. 5,315,962).

Applicant has amended independent Claim 1, to claim a variable valve, comprising:

25 a valve body comprising at least one conduit defined therethrough;  
a first cylinder having a first aperture corresponding to each of the at least one conduit, wherein the first cylinder is rotatable within the valve body between a first position and a second position; and

30 a second cylinder in direct contact with the first cylinder having a second aperture corresponding to each of the at least one conduit, wherein the second cylinder is rotatable within the valve body between the first position and the second position;

such that the first aperture and the second aperture form a single variable sized opening corresponding to each of the at least one conduit when the first cylinder and the second cylinder move from the first position toward the second position;

wherein the single variable sized opening defines a cross section by which a passage through the respective conduit is unrestricted.

Applicant has amended independent Claim 14, to claim a variable valve apparatus, comprising:

- 5 a body having at least one conduit;
- a first cylinder coupled to the body, the first cylinder having a first aperture cut therethrough corresponding to each of the at least one conduit, wherein the first cylinder is rotatable between an open position and a closed position; and
- 10 a second cylinder coupled to the body and in direct contact with the first cylinder, the second cylinder having a second aperture cut therethrough corresponding to each of the at least one conduit, wherein the second cylinder is configured to rotate between an open position and a closed position;
- whereby the first aperture and the second aperture form a single variable
- 15 sized opening corresponding to each of the at least one conduit; and
- wherein the first aperture and the second aperture define a single variable sized opening by which a passage through the at least one conduit is unrestricted.

Applicant has amended independent Claim 25, to claim a variable valve apparatus comprising:

- a body having at least one passage defined therethrough;
- a first cylinder coupled to the body, the first cylinder having a first aperture corresponding to each of the at least one passage and configured to move
- 25 between a first position and a second position; and
- a second cylinder coupled to the body and in direct contact with the first cylinder, the second cylinder having a second aperture corresponding to each of the at least one passage and configured to move between the first position and the second position;
- 30 such that the first aperture and the second aperture form a single variable sized opening corresponding to each of the at least one passage when the first cylinder and the second cylinder move between the first position and the second position;
- such that in the respective first positions, the first aperture and the second
- 35 aperture define a closed position to cut off flow, and an in the respective second

positions, the first aperture and the second aperture define a single variable sized opening by which the passage through the respective conduit is unrestricted.

- 5 Applicant has amended independent Claim 35, to claim a method of assembling a variable valve apparatus, comprising the steps of:

providing a body having at least one conduit, wherein the at least one conduit is configured to have an open position and a closed position;

- 10 coupling a first cylinder to the body, the first cylinder having a first aperture corresponding to each of the at least one conduit and configured to be moveable such that the first aperture is in complete communication with the at least one conduit in the open position; and

- 15 coupling a second cylinder to the body and in direct contact with the first cylinder, the second cylinder having a second aperture corresponding to each of the at least one conduit and configured to be moveable such that the second aperture is in complete communication with the at least one conduit in the open position;

- 20 wherein the first aperture and the second aperture define a single variable sized opening by which a flow through the respective conduit is unrestricted when the first aperture and the second aperture are in the open position.

Applicant has amended independent Claim 46, to claim a valve comprising:

- 25 a body;  
a first means for channeling a flow through the body; and  
a second means for channeling the flow through the body;  
wherein the first means and the second means are configured to directly contact one another and to rotatably move in an opposite direction from one another, thereby forming at least one variable sized aperture; and  
30 wherein the first means and the second means define a single variable sized opening for each of the variable sized apertures by which the channeled flow through the body is unrestricted when the first means and the second means are in an open position, and wherein the first means and the second means define a cross section by which the channeled flow through the body is completely closed when the first means and the second means are in a closed position.  
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Applicant has amended independent Claim 50, to claim a variable valve comprising:

5 a first rotatable cylinder having a first aperture, wherein the first rotatable cylinder rotates between a first position and a second position;

a second rotatable cylinder having a second aperture, wherein the second rotatable cylinder directly contacts the first rotatable cylinder and rotates in cooperation with the first rotatable cylinder such that the first aperture and the second aperture form a single variable sized opening when the first rotatable cylinder rotates from the first position toward the second position;

10 wherein the first rotatable cylinder and the second rotatable cylinder define a cross section by which a flow through the single variable sized opening is unrestricted when the first rotatable cylinder is in the first position, and wherein the first rotatable cylinder and the second rotatable cylinder define a cross section by which the flow is closed when the first rotatable cylinder is in the closed position.

Applicant has amended independent Claim 59, to claim a variable valve apparatus, comprising:

20 a body having at least one conduit, wherein the at least one conduit is configured to have an open position and a closed position;

a first cylinder coupled to the body, the first cylinder having a first aperture corresponding to each of the at least one conduit and configured to be moveable such that the first aperture is in complete communication with the at least one conduit in the open position; and

25 a second cylinder coupled to the body and in direct contact with the first cylinder, the second cylinder having a second aperture corresponding to each of the at least one conduit and configured to be moveable such that the second aperture is in complete communication with the at least one conduit in the open position;

30 wherein the first aperture and the second aperture define a single variable sized opening in the open position which does not restrict a passage of a flow through the respective conduit.

Applicant has also amended dependent claims 7, 8, 18, 19, 29, 32, 39, 54, and 63, to provide proper antecedent terminology to the claims from which they depend.

5 Support is seen in the Application as filed, at least on page 2, lines 11-29; on  
page 2, lines 34-36; on page 3, lines 5-15 and 25-37; on page 4, lines 3-18 and  
27-30; on page 5, line 17 to page 6, line 2; on page 7, line 29 to page 8, line 9;  
on page 8, line 23 to page 9, line 6; on page 9, line 24 to page 11, line 31; in  
Claims 1, 14, 25, 35, 46, 50 and 59; and in Figures 1A, 1B, 2A, 2B, 2C, 3A, 3B,  
10 and 3C.

Renault at el describe valves for a duct, and a two-stroke combustion engine  
incorporating the valves, as seen at least in the Abstract, wherein:

15 "Rotating valves are set forth especially for use in two stroke internal  
combustion engines. The valve has two rotating parts which come into  
tangential pseudocontact with each other. Each rotating part has a solid  
surface of revolution which closes off flow and a recessed portion which  
permits flow."

20 Applicant submits that, although Renault at el describes a valve which has two  
rotating parts which come into tangential pseudocontact with each other, Renault  
at el. do not disclose a first cylinder or means and a second cylinder or means  
which directly contact each other and define single variable sized opening for  
25 one or more conduits or passages.

Details regarding variable valves as described by Renault at el. are seen at least  
in col. 3, lines 43-61, wherein:

30 "The rotating parts of each pair come into tangential pseudocontact either  
against one another or against the opposing faces of an intermediate  
element having a leading end and a trailing end, seen in the direction of  
the flow of the fluid, the leading end being tapered to a point and the  
cross-section of the said intermediate element increasing from the leading  
35 end to the trailing end.

This shape of the intermediate element minimizes the flow loss caused by its presence in the duct.

5 When the rotating parts come into tangential pseudocontact against one another, they are cylindrical.

10 When the rotating parts come into tangential pseudocontact with the opposing faces of an intermediate element, it [sic] may be ovoid so as to match the perimeter of the cylinder and thus to reduce the dead volume which separates them from the inlet or exhaust ports. This thus reduces the effects of delays due to the compression of the gas column trapped at this location."

15 Details regarding intermediate elements in Renault at el. are seen at least in col. 4, lines 8-25, wherein:

20 "When the engine is equipped with a turbocharger, it is advantageous for the rotating parts of the system for rapid closure and rapid opening of the exhaust duct to come into tangential pseudocontact with the opposing faces of an intermediate element which is extended, on the upstream side, seen in the direction of exhaust of the gases and from the tangential points of contact, substantially as far as the exhaust port, and, on the downstream side, as far as a partition dividing the duct into a lower branch  
25 and an upper branch, the lower branch being connected to the actual exhaust and the upper branch being connected to the said turbocharger.

30 The intermediate element may be mounted so as to oscillate about an axis passing through its trailing end so as to be able to select two possible orientations of the leading end of the said element, and, thus, a longer turbocharger pressure feed time at low speeds and a shorter pressure feed time at high speeds."

Further details regarding intermediate elements in Renault at el. are seen at least in Col. 5, lines 31-60, wherein:

5 "As emerges from FIGS. 1 to 9, a median intermediate element 23 separates the duct 7 into an upper half and a lower half, upstream--seen in the direction of flow of the fresh gases--of the curved parts 15a, 15b, and in the immediate vicinity of the latter. This median element 23 has an upstream, or leading, end 24, tapered to a point, and a downstream, or trailing, end 25, the cross-section of the element 23 increasing from the leading end 24 to the trailing end 25. During their rotation in opposition, the solid parts 20a and 20b of the curved parts 15a and 15b come into tangential pseudo-contact with the opposing faces of the intermediate element 23 which has, to this end, suitable bores which are indicated, on the corresponding part 23' in FIG. 8, by the references 23'a, 23'b.

An identical structure is provided in the exhaust duct 9 and the corresponding parts are denoted by the same references followed by the "prime" sign (FIG. 8). However, it will be seen that, on the exhaust side, the 14a'-22a'/14b'-22b' assembly (system E) is located much closer to the exhaust port 10 than the 14a-22a/14b-22b assembly (system A) is from the inlet ports 8. Moreover, the leading end 24' of the intermediate element 23' almost reaches the exhaust port 10 and a partition 26 follows the trailing end 25' of the said element 23'. This partition 26 divides the exhaust duct 9 into an upper half-duct 27 and a lower half-duct 28. The upper-half duct 27 is connected to a turbocharger, not shown, while the lower half-duct 28 is connected to the actual exhaust."

Additional details regarding intermediate elements in Renault at el. are seen at least in Col. 7, lines 14-21:

5 "It emerges from FIG. 8 that the trailing end 25 of the intermediate element 23' is traversed by a pivoting spindle 32 which makes it possible to give two extreme orientations to the leading end 24' of the said element, namely an orientation pointing at C, permitting a longer turbocharger pressure feed time at low rotational speeds of the engine, then an orientation pointing towards D for high speeds."

10 Applicant therefore submits that, while Renault et al. discloses valves in which rotating elements come into "tangential pseudocontact" with each other or with an intermediate element, Renault et al. do not disclose a valve in which rotating elements come into direct contact with each other, such that the resulting opening is unrestricted.

15 As seen in Renault et al, at least in FIG. 11, the exemplary openings provided between elements 29'a and 29'b provides a plurality of passages 27 and 28, divided by the intermediate element 26. As also seen in the exemplary embodiment shown FIG. 11, elements 29'a and 29'b are separated by the intermediate element 26, and do not directly contact each other.

20 As well, there is no suggestion, express or implied, that the rotating members be modified to meet Claims 1, 14, 25, 35, 46, 50 and 59, as amended. It would take further modification, not taught in Renault et al., to meet the Claims 1, 14, 25, 35, 46, 50 and 59, as amended. As Renault fails to describe or note the advantage of direct contact between the cylinder elements, i.e. the creation of an  
25 unrestricted opening, such a modification is not obvious.

Applicant therefore submits that Claims 1, 14, 25, 35, 46, 50 and 59, as amended, overcome the rejections under 35 U.S.C. §102(b) as being anticipated by Renault et al. (U.S. Patent No. 5,315,962). As claims 2-13 depend from  
30 Claim 1, as Claims 15-24 depend from Claim 14, as Claims 26-34 depend from Claim 25, as Claims 36-45 depend from Claim 35, as Claims 47-49 depend from Claim 46, as Claims 51-58 depend from Claim 50, and as Claims 60-69 depend



from Claim 59, and include all the limitations of the Claims they depend from, they are also seen to be patentable as well.

### CONCLUSION

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Applicant also respectfully submits that Claims 1, 14, 25, 35, 46, 50 and 59, as amended, and dependent claims 2-13, 15-24, 26-34, 36-45, 47-49, 51-58, and 60-69 overcome the rejections set forth in the Office Action. Applicant also submits that the amendments do not introduce new matter into the Application.

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Based on the foregoing, Applicant considers the invention to be in condition for allowance. Applicant earnestly solicits the Examiner's withdrawal of the rejections set forth in the prior Office Action, such that a Notice of Allowance is forwarded to Applicant, and the present application is therefore allowed to issue as a United States patent.

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Respectfully Submitted,



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